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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/426,087 10/22/99 DRURY

P 27754/35306A

EXAMINER

MMC2/0228

MARSHALL O'TOOLE GERSTEIN
MURRAY & BORUN
6300 SEARS TOWER
233 SOUTH WACKER DRIVE
CHICAGO IL 60606-6402

FEGGINS, K

ART UNIT	PAPER NUMBER
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2861

DATE MAILED:

02/28/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No. 09/426,087	Applicant(s) DRURY ET AL.	
	Examiner Kristal Feggins	Art Unit 2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claims ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- | | |
|---|--|
| 15) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 18) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____. |
| 16) <input checked="" type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 19) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 17) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>5 & 7</u> . | 20) <input type="checkbox"/> Other: |

DETAILED ACTION

Specification

1. This application is informal in the arrangement of the specification. The following guidelines illustrate the preferred layout and content for patent applications. These guidelines are suggested for the applicant's use.

Content of Specification

- (a) Title of the Invention: See 37 CFR 1.72(a). The title of the invention should be placed at the top of the first page of the specification. It should be brief but technically accurate and descriptive, preferably from two to seven words.
- (b) Cross-References to Related Applications: See 37 CFR 1.78 and MPEP § 201.11.
- (c) Statement Regarding Federally Sponsored Research and Development: See MPEP § 310.
- (d) Reference to a "Microfiche Appendix": See 37CFR 1.96(c) and MPEP § 608.05. The total number of microfiche and the total number frames should be specified.
- (e) Background of the Invention: The specification should set forth the Background of the Invention in two parts:
 - (1) Field of the Invention: A statement of the field of art to which the invention pertains. This statement may include a paraphrasing of the applicable U.S. patent classification definitions of the subject matter of the claimed invention. This item may also be titled "Technical Field."
 - (2) Description of the Related Art: A description of the related art known to the applicant and including, if applicable, references to specific related art and problems involved in the prior art which are solved by the applicant's invention. This item may also be titled "Background Art."

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- (f) Brief Summary of the Invention: A brief summary or general statement of the invention as set forth in 37 CFR 1.73. The summary is separate and distinct from the abstract and is directed toward the invention rather than the disclosure as a whole. The summary may point out the advantages of the invention or how it solves problems previously existent in the prior art (and preferably indicated in the Background of the Invention). In chemical cases it should point out in general terms the utility of the invention. If possible, the nature and gist of the invention or the inventive concept should be set forth. Objects of the invention should be treated briefly and only to the extent that they contribute to an understanding of the invention.
- (g) Brief Description of the Several Views of the Drawing(s): A reference to and brief description of the drawing(s) as set forth in 37 CFR 1.74.
- (h) Detailed Description of the Invention: A description of the preferred embodiment(s) of the invention as required in 37 CFR 1.71. The description should be as short and specific as is necessary to describe the invention adequately and accurately. This item may also be titled "Best Mode for Carrying Out the Invention." Where elements or groups of elements, compounds, and processes, which are conventional and generally widely known in the field of the invention described and their exact nature or type is not necessary for an understanding and use of the invention by a person skilled in the art, they should not be described in detail. However, where particularly complicated subject matter is involved or where the elements, compounds, or processes may not be commonly or widely known in the field, the specification should refer to another patent or readily available publication which adequately describes the subject matter.
- (i) Claim or Claims: See 37 CFR 1.75 and MPEP § 608.01(m). The claim or claims must commence on separate sheet. (37 CFR 1.52(b)). Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation. There may be plural indentations to further segregate subcombinations or related steps.
- (j) Abstract of the Disclosure: A brief narrative of the disclosure as a whole in a single paragraph of 250 words or less on a separate sheet following the claims.
- (k) Drawings: See 37 CFR 1.81, 1.83-1.85, and MPEP § 608.02.
- (l) Sequence Listing: See 37 CFR 1.821-1.825.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 9, the recitations, "preferably wider" is indefinite. It is unclear if the Applicant is or is not including the dimension of being wider part of the invention or not.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-9, 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Allen et al. (EP 0 564 102 A2).

Allen et al. discloses the following claimed limitations:

- * droplet deposition apparatus (Abstract)
- * a fluid chamber having actuator means actuable by electrical signals to effect ejection of droplets from the fluid chamber (col 4, lines 24-58, col 5, lines 1-20, fig 1a)
- * drive circuit means for supplying the electrical signals to the actuator means (col 5, lines 5-58, col 6, lines 1-34, figs 1a, 1b, 2, 4)

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* conduit means for conveying droplet fluid to or from said fluid chamber, said drive circuit means being in substantial thermal contact with said conduit means so as to transfer a substantial part of the heat generated in said drive circuit to said droplet fluid (col 5, lines 5-58, col 6, lines 1-34, figs 1a, 1b, 2, 4)

* first conduit means for supplying droplet fluid to said fluid chamber and second conduit means for leading droplet fluid from said fluid chamber (col 5, lines 5-58, col 6, lines 1-34, figs 1a, 1b, 2, 4)

* wherein said drive circuit means is thermally connected to the second conduit means (col 5, lines 5-58, col 6, lines 1-34, figs 1a, 1b, 2, 4)

* wherein the drive circuit is incorporated within an integrated circuit package/multiplexer chips, of substantially cuboid form in which at least some of the faces are rectangles each having a surface area, a face other than that face having the smallest surface area being arranged so as to lie substantially parallel to the direction of fluid flow in that part of the conduit closest to said face, and to be in substantial thermal contact with the fluid (col 5, lines 21-55, figs 1a)

* wherein the face having the greatest surface area is arranged so as to lie parallel to the direction of fluid flow (col 5, lines 21-55, figs 1a)

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* at least on droplet ejection unit comprising a plurality of fluid chamber, actuator means and a plurality of nozzles arranged in a row, said actuator means being actuatable to eject a droplet of fluid from a fluid chamber through a respective nozzle(col 4, lines 24-58, col 5, lines 1-20, fig 1a)

* a support member for said at least on droplet ejection unit, said support member comprising at least one droplet fluid passageway communication with said plurality of fluid chambers and arranged so as to convey droplet fluid to or from said fluid chambers in a direction substantially parallel to said nozzle row and to transfer a substantial part of the heat generated during droplet ejection to said conveyed droplet fluid (col 4, lines 27-58, col 5, lines 1-20, fig 1a).

* wherein the droplet fluid passageway occupies the majority of the cross-sectional area of the support member (figs 1a, 4, 5).

* wherein the droplet fluid passageway comprises respective portions for conducting droplet fluid into and away from each fluid chamber (figs 1a, 4, 5).

* wherein the cross-section of support member is (preferably) wider in the direction of ink ejection from the nozzles than in the direction of the nozzle row (figs 1a, 4, 5)

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* a plurality of said droplet ejection units, the support member supporting the droplet ejection units side by side in the direction of the nozzle rows, the support member comprising at least one droplet fluid passage way communication with at least two of said ejection units and arranged so as to convey droplet fluid to or from said ejection units in a direction substantially parallel to said nozzle rows and to transfer a substantial part of the heat generated during droplet ejection to said conveyed droplet fluid (col 4, lines 27-58, col 5, lines 1-20, fig 1a).

6. Claims 13-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Hackleman (5,734,394).

Hackleman discloses the following claimed limitations:

* droplet deposition apparatus (Abstract)

* a fluid chamber, at least part of which is formed from a first material having a first coefficient of thermal expansion, said chamber being associated with actuator means actuable to eject a droplet from the chamber and having a port for the inlet of droplet fluid thereto (Abstract, col 5, lines 1-21, 58-67, col 6, lines 1-67, figs 1, 5)

* a support member for said fluid chamber and including a passageway for supply of droplet liquid to said port, the support member being defined at least in part by a second material having a second coefficient of thermal expansion greater than said first coefficient (Abstract, col 5, lines 1-21, 58-67, col 6, lines 1-67, figs 1, 5)

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* means for attaching the fluid chamber to the support member in order to substantially avoid transfer of thermal deformation of the support member to said fluid chamber (Abstract, col 7, lines 30-67, col 8, lines 1-67, col 9, lines 1-7, figs 8-12)

* wherein the attachment means comprises resilient bonding means for bonding the fluid chamber to the support member (col 7, lines 30-67, col 8, lines 1-67, col 9, lines 1-7, figs 8-12)

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Allen et al. (EP 0 564 102 A2) in view of Drake (EP 0 512 799 A2).

Allen et al. disclose all of the claimed limitations except for the following:

* wherein the support member comprises material having a higher thermal conductivity than said at least one droplet ejection unit.

* means for attaching said at least one droplet ejection unit to the support member in order to substantially avoid transfer of thermal deformation of the support member to said at least one droplet ejection unit

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Drake discloses the following claimed limitations:

* wherein the support member comprises material having a higher thermal conductivity that said at least one droplet ejection unit (col 11, lines 28-55, col 12, lines 48-58, col 13, line 1)

* means for attaching said at least one droplet ejection unit to the support member in order to substantially avoid transferral of thermal deformation of the support member to said at least one droplet ejection unit (col 11, lines 28-55, col 12, lines 48-58, col 13, line 1, figs 6, 9)

It would have been obvious at the time of the invention was made to a person having ordinary skill in the art to utilize a support member with a material having a higher thermal conductivity that said at least one droplet ejection unit and means for attaching said at least one droplet ejection unit to the support member in order to substantially avoid transferal of thermal deformation of the support member to said at least one droplet ejection unit, taught by Drake into Allen et al. for the purpose of providing an improved pagewidth thermal ink jet printhead.

9. Claims 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hackleman (5,734,394) in view of Silverbrook (6,171,875 B1).

Hackleman discloses all of the claimed limitations except for the following:

- * wherein the or each fluid chamber comprises a channel formed in a body of piezoelectric material and closed by a cover member substantially thermally matched to the piezoelectric material

- * wherein ink supply ports/slots are formed in said cover

- * wherein at least one ink ejection nozzle is formed in said body of piezoelectric material

Silverbrook discloses the following claimed limitations:

- * wherein the or each fluid chamber comprises a channel formed in a body of piezoelectric material and closed by a cover member substantially thermally matched to the piezoelectric material (Abstract, col 7, lines 5-27)

- * wherein ink supply ports/slots are formed in said cover (Abstract)

- * wherein at least one ink ejection nozzle is formed in said body of piezoelectric material (Abstract, col 7, lines 5-27)

It would have been obvious at the time of the invention was made to a person having ordinary skill in the art to utilize fluid chambers wherein a channel formed in a body of piezoelectric material and closed by a cover member substantially thermally matched to the piezoelectric material ; wherein ink supply ports/slots are formed in said cover and at least one ink ejection nozzle is formed in said body of piezoelectric

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material, taught by it, taught by Silverbrook into Hackleman for the purpose of providing a printer that can supply ink on demand from a nozzle chamber efficiently.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to K. Feggins whose telephone number is 703-306-4548. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le can be reached on 703-308-0750. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



N. Le
Supervisory Patent Examiner
Technology Center 2800

K7
RF

February 23, 2001